

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A positive electrode active material, comprising:

a layered lithium manganese compound represented by a general formula $\text{Li}_{1-x}\text{MO}_2$,

wherein the M is manganese or a metal of two or more kinds containing manganese

as a main component, and

the x is a lithium-deficient quantity and satisfies the following expression:

$$\begin{matrix} 0.2 \\ 1/5 < x \end{matrix} \quad \text{Li} < 0.8$$

and the layered lithium manganese compound satisfies a value of bond overlap

population (BOP) between ^{central} a manganese atom and ^{first} a proximate oxygen atom as more than or equal to 0.23.

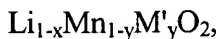
2. (Currently Amended) The positive electrode active material according to claim 1,

wherein the x satisfies the following expression:

$$1/5 < x < 1/2, \quad 0.5 < \text{Li} < 0.8$$

3. (Currently Amended) The positive electrode active material according to claim 1,

wherein the general formula $\text{Li}_{1-x}\text{MO}_2$ is further represented by a formula



the M' is at least one of ~~metals~~ a metal other than manganese, substituting for manganese (Mn) and y is a substitution quantity thereof,

the x is represented by a ratio of a/b ($x = a/b$), each of the a and b is a natural number ranging from 1 to 30, and the a and b satisfy: $a < b$, and $1/5 < a/b$,

the y is represented by a ratio of c/d ($y = c/d$), each of the c and d is a natural number ranging from 1 to 30, and the c and d satisfy: $c < d$, and

~~the lithium-manganese compound has a crystal structure with the Li deficient quantity x and the M' substituting quantity y being regularly adjusted.~~

4. (Currently Amended) The positive electrode active material according to claim 2,

wherein the general formula $\text{Li}_{1-x}\text{MO}_2$ is further represented by a formula $\text{Li}_{1-x}\text{Mn}_{1-y}\text{M}'_y\text{O}_2$,

the M' is at least one of ~~metals~~ a metal other than manganese, substituting for manganese (Mn) and the y is a substitution quantity thereof,

the x is represented by a ratio of a/b ($x = a/b$), each of the a and b is a natural number ranging from 1 to 30, and the a and b satisfy: $a < b$, and $1/5 < a/b < 1/2$,

the y is represented by a ratio of c/d ($y = c/d$), each of c and d is a natural number ranging from 1 to 30, and c and d satisfy: $c < d$, and


~~the lithium-manganese compound has a crystal structure with the Li deficient quantity x and M' substitution quantity y being regularly adjusted.~~

5. (Currently Amended) The positive electrode active material according to claim 3,

wherein the M' is ~~at least one of~~ selected from 3d-transition metals.

6. (Currently Amended) The positive electrode active material according to claim 4,

wherein the M' is ~~at least one of~~ selected from 3d-transition metals.

7. (Currently Amended) The positive electrode active material according to claim 3,
wherein the M' is at least one of iron (Fe) ~~and~~ or nickel (Ni).
8. (Currently Amended) The positive electrode active material according to claim 4,
wherein the M' is at least one of iron (Fe) ~~and~~ or nickel (Ni).
9. (Original) The positive electrode active material according to claim 3,
wherein the M' is chromium (Cr).
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10. (Original) The positive electrode active material according to claim 4,
wherein the M' is chromium (Cr).
11. (Currently Amended) The positive electrode active material according to claim 3,
wherein ~~a composition variation range of the x~~ is stabilizes set within $\pm 5\%$.
12. (Currently Amended) The positive electrode active material according to claim 4,
wherein ~~a composition variation range of the x~~ is stabilizes set within $\pm 5\%$.
13. (Currently Amended) The positive electrode active material according to claim 3,
wherein ~~a composition variation range of the y~~ is stabilizes set within $\pm 5\%$.
14. (Currently Amended) The positive electrode active material according to claim 4,
wherein ~~a composition variation range of the y~~ is stabilizes set within $\pm 5\%$.

Claims 15-16 (Canceled)

17. (Currently Amended) The positive electrode active material according to claim ~~15~~ 21,

wherein the general formula $\text{Li}_{1-x}\text{Mn}_{1-y}\text{M}'_y\text{O}_{2-\delta}$ is further represented by a general formula $\text{Li}_{1-x}\text{Mn}_{1-y}\text{M}'_{y(1-z)}\text{M}''_{yz}\text{O}_{2-\delta}$, ^{no}

where the M'' is at least one metal substituting for the M' , the z is a substitution quantity thereof, and is a rational number represented by a ratio of e/f ($z = e/f$), and

each of the e and f is a natural number ranging from 1 to 30 and

the e and f satisfy: $e < f$.

18. (Currently Amended) The positive electrode active material according to claim ~~16~~ 22,

wherein the general formula $\text{Li}_{1-x}\text{Mn}_{1-y}\text{M}'_y\text{O}_{2-\delta}$ is further represented by a general formula $\text{Li}_{1-x}\text{Mn}_{1-y}\text{M}'_{y(1-z)}\text{M}''_{yz}\text{O}_{2-\delta}$, ^{no}

where the M'' is at least one metal substituting for the M' , the z is a substitution quantity thereof, and is a rational number represented by a ratio of e/f ($z = e/f$), and

each of the e and f is a natural number ranging from 1 to 30, and the e and f satisfy: $e < f$.

19. (Original) A method of preparing the positive electrode active material of claim 1, comprising:

mixing a lithium compound and a manganese compound in a ratio equivalent to a composition ratio of Li and Mn in a general formula; and

baking a mixture obtained in the mixing step in an atmosphere with an oxygen concentration of 1000 ppm or lower.

20. (Original) A rechargeable lithium-ion battery, comprising:

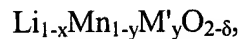
a positive electrode containing the positive electrode active material according to claim 1;

a negative electrode containing at least one selected from the group consisting of a Li metal, complex oxide, nitride and a carbon material; and

an electrolyte interposed between the positive and negative electrodes.

21. (New) A positive electrode active material, comprising:

a layered lithium manganese compound represented by a general formula:



wherein the M' is at least one of a metal other than manganese, substituting for manganese (Mn) and y is a substitution quantity thereof,

the x is represented by a ratio of a/b ($x = a/b$), each of the a and b is a natural number ranging from 1 to 30, and the a and b satisfy: $a < b$, and $1/5 < a/b$,

the y is represented by a ratio of c/d ($y = c/d$), each of the c and d is a natural number ranging from 1 to 30, and the c and d satisfy: $c < d$,

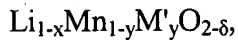
the δ denotes an oxygen-deficient quantity and satisfies the following expression:

$$\delta < 0.2, \text{ and}$$

the layered lithium manganese compound satisfies that a value of bond overlap population (BOP) between a manganese atom and a proximate oxygen atom is more than or equal to 0.23.

22. (New) A positive electrode active material, comprising:

a layered lithium manganese compound represented by a general formula:



wherein the M' is at least one of a metal other than manganese, substituting for manganese (Mn) and y is a substitution quantity thereof,

the x is represented by a ratio of a/b ($x = a/b$), each of the a and b is a natural number ranging from 1 to 30, and the a and b satisfy: $a < b$, and $1/5 < a/b < 1/2$,

the y is represented by a ratio of c/d ($y = c/d$), each of the c and d is a natural number ranging from 1 to 30, and the c and d satisfy: $c < d$,

the δ denotes an oxygen-deficient quantity and satisfies the following expression:

$$\delta < 0.2, \text{ and}$$

the layered lithium manganese compound satisfies that a value of bond overlap population (BOP) between a manganese atom and a proximate oxygen atom is more than or equal to 0.23.